Guidance for the Use of AI in the K-12 Classroom

In the age of internet searching and smartphones, students can look up answers to factual-based questions almost instantaneously. This shift has encouraged teachers to develop assignments that push students to think deeply beyond online resources. As a result, students have had to develop critical thinking skills to determine which sources provide the most accurate information for a specific task or need. The advent of AI adds another layer to this by allowing students to have papers, artwork, and other creative tasks completed for them with a well-written prompt and the right AI-generative tool.

Furthermore, many jobs and careers will require AI tools to perform routine tasks or as brainstorming and drafting tools. This presents a unique opportunity to engage students in rich and intellectually demanding assignments that deeply engage students in individual and collaborative creativity. AI must become seen as a tool rather than the final product.

As artificial intelligence (AI) continues to embed itself in various aspects of everyday life, its integration into education presents tremendous opportunities and unique challenges. Educators, administrators, and other shareholders now face a rapidly changing technological landscape that is often difficult to navigate. In this context, clear and comprehensive guidance is crucial to help these shareholders understand how to effectively incorporate AI tools while addressing potential ethical, pedagogical, and practical concerns.

This document serves as a resource for educators, providing a balanced exploration of the opportunities and the cautions involved in using AI in the classroom. It highlights how AI can enhance personalized learning, improve data-driven decision-making, and free up teachers' time for more meaningful student interactions. At the same time, it addresses the potential risks, such as data privacy issues, algorithmic biases, and the importance of maintaining the human element in teaching. For a detailed overview of the skills and attributes required for teachers to be AI-literate, refer to Appendix A, which outlines the competencies necessary to effectively engage with AI in the classroom. By following these guidelines, educators will be better equipped to harness the power of AI while mitigating potential pitfalls responsibly.

SREB | Southern Regional Education Board

SREB.org | November 2024

While the primary audience for this guidance is teachers and school or district administrators, its relevance extends beyond the classroom. Policymakers can use this document to inform the creation of regulations that ensure the ethical and equitable use of AI in education. Technology developers will benefit from insights into the educational needs and priorities that can guide the design of more effective AI tools. Researchers, too, may find this document valuable as they explore the evolving role of AI in education, helping to shape future innovations that support teaching and learning.

Ultimately, this guidance aims to promote thoughtful and responsible AI adoption in education, ensuring that it enhances, rather than detracts from, schools' core mission of fostering student success.

Pillars of AI Use in the Classroom

Pillar #1: Use AI-infused tools to develop more cognitively demanding tasks that increase student engagement with creative and innovative thinking.

To best prepare students for an AI-embedded workforce, now more than ever students will need to be prepared to think critically and creatively. Teachers will need to design assignments and assessments where AI may be used as part of the process, but student ingenuity is required to complete the tasks. Hess's Cognitive Rigor Matrix gives a framework for classifying student assignments and tasks in both the depth of knowledge dimension (factual, conceptual, short-term strategic thinking, and extended strategic thinking) and the cognitive process dimension (lower order thinking skills to higher order thinking skills)[1] (see Appendix 1 for an example matrix). In many classrooms, the bulk of assignments students are exposed to are situated in the top left quadrant of Hess's Cognitive Rigor Matrix, representing factual and conceptual tasks that require lower-order processing skills (remember and understand). These assignments are also the easiest for AI to produce. However, tasks that students will face in their careers are more likely to mirror those in the bottom right of Hess's matrix, which represents strategic thinking, i.e., tasks that require higher-order processing skills such as applying, evaluating, and creating. Designing these cognitively demanding assignments that align with state content standards can take a lot of teacher planning time. AI-infused tools can assist in creating these tasks more quickly and efficiently.

AI can draw on a broad spectrum of knowledge and has the power to analyze a wide range of resources not typically available in classrooms. Now, more than ever, there is a shift towards students needing to be creators rather than merely purveyors of knowledge. Students should be taught the ethical use of these tools as part of their creation process, allowing them to focus class time on polishing and adding their unique creativity to their work. While AI should not be the final step in the creative process, it can effectively serve in the early stages.

Opportunities

- **AI as a Lesson Planning Partner**: AI can help streamline the lesson planning process by creating assignments that shift toward a higher depth of knowledge (bottom right of Hess's Matrix). Teachers, administrators, and other support professionals can use AI to assess current assignments' intellectual demands and quickly provide ideas for deepening cognitive demand on those assignments.

- **Critical Thinking Skills**: AI is paving the way for more creative and innovative assignments that cannot be completed easily with AI (moving from knowledge reproduction to knowledge application). Teachers will need to intentionally teach critical thinking skills such as assessing information, data, and other products for their "realness" vs AI-generated material.

Cautions

- **Effective Use of AI**: Teachers and students will need to learn how to be effective prompt engineers and use critical thinking skills to measure the value of the information generated (e.g., the new search strings and knowing source credibility online).

- **Recognize the inherent Bias in AI Systems**: AI has intrinsic biases and can provide decisions and products that do not fully capture the complexities of a problem or task. Teachers and students must use AI tools as a starting point and not solely rely on them as the best decision or product. Students will need to develop their written voice so they can personalize what an AI-infused app creates for them.

- **Ensuring Mastery of State and District Standards**: While AI can be an excellent starting point for creating more intellectually demanding tasks, AI systems may not know their specific state and district standards or individual students. Teachers must balance AI-generated tasks with their unique standards, pedagogy, and students' interests and learning needs.

- **Process-Focused Teaching**: Some fear that AI will replace student thinking. One approach to this would be to ensure that students grasp underlying knowledge and concepts before using AI in creativity and evaluation processes such as editing, brainstorming, and drafting. In other words, "Teach the long way first, then show students AI tools to enhance productivity."

Educator's Story

To be filled in later

Resources

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2. Code.org, CoSN, Digital Promise, European EdTech Alliance, Larimore, J., and PACE (2023). AI Guidance for Schools Toolkit. Retrieved from teachai.org/toolkit. [October 2024].
3. Aqua. (2023, July 30). The Impact of Artificial Intelligence on Education - How AI is Revolutionizing the Learning Experience. AI News. https://aquariusai.ca/blog/the-impact-of-artificial-intelligence-on-education-how-ai-is-revolutionizing-the-learning-experience.

Pillar #2: Use AI to streamline teacher administrative and planning work.

Teachers' jobs have become increasingly more complex. On top of planning highly engaging and cognitively demanding lessons and assignments, teachers also communicate with parents, develop plans of support for a variety of student behavior and learning needs, serve on school-based committees, review and analyze assessment and classroom data, manage the day-to-day affairs of their classrooms and provide timely feedback and grades on assignments. This is expected to fit in a 60 - 90 minute planning window that may also be utilized for team and other school-based meetings. Teachers can use AI-infused technology and software as administrative assistants and planning partners. Already, teachers are starting to see how AI can streamline their work so they can focus on more important aspects of their work, such as designing enriching learning experiences for their students.

Opportunities

- **AI as a Planning Partner**: AI chatbots like ChatGPT or Magic School AI allow teachers to have a planning partner with a vast knowledge bank at their fingertips. Teachers can ask for lesson or unit planning ideas with specific pedagogical frameworks and specific standards. AI chatbots can serve as brainstorming partners, which help teachers expand their horizons and enhance their creativity to create more personalized and engaging content for their students.

- **Improve and Enhance Current Assignments**: Teachers can use AI to improve current assignments and ask for ideas to increase cognitive demand, differentiate them for specific learning needs, or even provide more interactive activities. With the click of a few buttons, teachers may also use tools such as ChatGPT, Brisk, or Magic AI to develop slides and graphic organizers or to develop questions based on a reading, image, or video. It can also provide AI-modeled and created examples of work for students to practice fact-checking, grammar and tone editing and practice giving feedback.

- **Help with Grading Student Work**: AI can enhance teacher grading by automating tasks like grading multiple-choice tests and fill-in-the-blank answers, providing preliminary evaluations for essays, and offering personalized feedback based on performance. Using natural language processing (NLP), AI can assess writing quality, provide grammar corrections, and consistently offer rubric-based feedback, reducing grading bias. It also integrates with grade books and analyzes student performance data, helping teachers identify trends and adjust instruction. Additionally, AI assists in plagiarism detection (including detecting AI use) and can act as a virtual assistant, answering student questions and lightening the grading workload.

- **Support with Other Aspects of Teaching**: While lesson and unit planning is an essential aspect of a teacher's job, they also have a myriad of other tasks they need to accomplish in a given day. AI-infused software can help draft parent newsletters, letters of recommendation, or emails with a specified tone. It can also help support English as a second language students by translating assignments and other learning materials and providing just-in-time interpretation between students and teachers or students to students.

Cautions

- **AI's Inherent Bias**: Every AI system has an inherent bias. Teachers must be aware of this bias and ensure that final plans meet students' needs and represent good pedagogical practice. They will need to work to assimilate what AI produces into their collective knowledge of pedagogy, their students' needs and interests, and their standards-based instruction. AI is a partner, not a replacement for a teacher. Moreover, Generative AI tools may invent plausible-sounding falsehoods or hallucinations. Teachers should always carefully evaluate and verify facts, figures, and data to ensure they do not present inaccurate information to students.

- **Importance of Student Data Privacy**: Federal and state laws mandate Districts and schools to protect the privacy and data of the students they serve. When examining any tool approved for use with students, the terms and conditions must be carefully reviewed to determine how student data and information will be used within and by the system. Many AI systems collect data from their users to learn and use that data to produce better results. Companies that design AI systems may also store this data and sell it to third parties. Therefore, when adding AI-embedded software, schools and districts must be very cautious to protect student data privacy by never using any personally identifiable information (PII) in AI systems. Schools and districts will need to develop checklists or other guides to evaluate the safety of an AI system for use with their students' PII.

Educator's Story

To be added later

Resources

1. Code.org, CoSN, Digital Promise, European EdTech Alliance, Larimore, J., and PACE (2023). AI Guidance for Schools Toolkit. Retrieved from teachai.org/toolkit. [October 2024].
2. Diebold, G., Han, C., & CENTER FOR DATA INNOVATION. (2022). How AI can improve K-12 education in the United States.
3. Ruiz, P., Richard, E., Chillmon, C., Shah, Z., Kurth, A., Fekete, A., Glazer, K., Pattenhouse, M., Fusco, J., Fennelly-Atkinson, R., Lin, L., Arriola, S., Lockett, D., Crawford-Meyer, V., Karim, S., Hampton, S., & Beckford, B. (2022). Emerging Technology Adoption Framework: for PK-12 education. https://doi.org/10.51388/20.500.12265/161
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Pillar #3: Use AI to support personalized learning.

Personalized learning is crucial in education because it acknowledges that each student learns differently and at their own pace. Traditional teaching methods often follow a uniform approach, which may not fully engage or challenge every student. AI can address this gap by analyzing vast student data - such as performance, engagement levels, and learning behaviors - to create individualized learning experiences. AI-powered platforms can dynamically adjust the content, difficulty level, and pacing to suit each student's needs. This ensures that struggling students receive additional support through targeted resources while more advanced students can be presented with increasingly challenging material. AI's ability to adapt in real time creates a more responsive and inclusive learning environment where each student can progress at a pace that matches their ability. By combining the strengths of AI with human instruction, K-12 education can become more responsive to individual needs, fostering a more effective and engaging learning environment for all students.

Personalized learning empowers students to take ownership of their education, a process that AI can further enhance. AI-driven tools can provide continuous, real-time feedback and customized recommendations for learning resources, such as videos, readings or practice exercises. This helps students stay engaged, motivated, and self-directed in their learning journey. By automating and scaling these processes, AI allows teachers to focus more on fostering deeper connections and critical thinking while ensuring that every student, regardless of their unique learning style or pace, has the tools to succeed. Ultimately, AI acts as a powerful facilitator of personalized learning, helping to create a more equitable, adaptive, and effective educational experience tailored to the needs of every student.

Opportunities

- **Supporting Students with Special Needs**: AI-powered tools can significantly enhance the learning experience for students with special needs by offering customized support. AI can assist with adaptive technologies, like text-to-speech for visually impaired students or speech recognition tools for those with speech or hearing challenges. Additionally, AI systems can adjust learning materials to match the unique needs of students with cognitive, physical, or emotional disabilities. This provides more adapted support, allowing students to fully participate and succeed in their educational journey.

- **Adaptive Learning Platforms:** AI can power adaptive learning systems that continuously assess student progress and adjust instructional materials in real time. These platforms help students progress at their own pace by offering tailored lessons, exercises, and assessments that match their skill levels and learning styles.

- **Intelligent Tutoring Systems**: AI-driven tutoring systems provide one-on-one support outside of class time, offering explanations, answering questions, and guiding students through problem-solving. These systems can mimic human tutors by offering personalized hints, encouragement, and feedback based on each student's unique needs.

- **Predictive Analytics**: AI can analyze historical data to predict student performance and identify at-risk students early. Teachers can use these insights to intervene with targeted support, such as extra tutoring or customized learning resources, preventing students from falling behind.

- **Automated Grading and Feedback**: AI can automate the grading process for objective (e.g., multiple-choice) and subjective (e.g., essays) assessments. This saves teachers time and provides students with immediate, personalized feedback on their work, accelerating the learning process.

- **Customizable Learning Resources**: AI can curate and recommend a wide range of learning materials based on each student's performance and interests. For example, if a

student struggles with fractions, the AI might suggest videos, interactive games, or exercises tailored to help them grasp the concept.

- **Enhanced Collaboration Tools**: AI-powered collaborative platforms can facilitate personalized group work by strategically forming student teams based on complementary skills, interests, or learning needs. These platforms can also provide real-time suggestions to guide teamwork and project-based learning.

- **Natural Language Processing (NLP) for Support**: AI-based NLP tools can help students with reading, writing, and language development. They can offer real-time grammar and spelling suggestions, assist with reading comprehension, and support students learning new languages through interactive conversations.

Cautions

- **Data Privacy and Security**: AI systems often rely on large amounts of student data, including performance metrics, learning behaviors, and personal information. Schools must ensure that student data is protected from breaches or misuse. It is critical to comply with privacy regulations like FERPA (Family Educational Rights and Privacy Act) and ensure that AI providers have robust data protection measures in place.

- **Bias in AI Algorithms**: AI algorithms are only as unbiased as the data used to train them. The AI may reinforce those biases if historical data used in AI systems contains bias, such as underrepresenting certain groups or demographics. Schools need to ensure that AI tools are developed and tested with fairness and inclusivity in mind so they don't disproportionately affect marginalized or underserved students.

- **Over-reliance on Technology**: AI should complement, not replace the human impact in education. Teachers provide essential emotional, social, and creative support that AI can't replace. Relying too heavily on AI for instruction or decision-making could diminish the personal connection and holistic understanding teachers bring to the classroom.

- **Access and Digital Divide**: AI-driven tools require consistent access to technology and the internet. AI may widen the achievement gap without equitable access to these resources, particularly for disadvantaged students. Schools need to ensure that all students have access to the necessary technology.

Educator's Story

To be filled in later

Resources

1. Code.org, CoSN, Digital Promise, European EdTech Alliance, Larimore, J., and PACE (2023). AI Guidance for Schools Toolkit. Retrieved from teachai.org/toolkit. [October 2024].
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Pillar #4: Develop students as ethical and proficient AI users.

Developing students as ethical and proficient AI users is crucial for shaping a future where technology serves humanity's best interests. As AI becomes increasingly integrated into various aspects of life, students must not only master the technical skills to use these tools effectively but also understand the ethical implications of their use. By cultivating a sense of responsibility and critical thinking about the consequences of AI-driven decisions, students can navigate the complexities of data privacy, bias, and transparency. This balanced approach ensures that future generations employ AI in ways that are both innovative and aligned with ethical standards, ultimately fostering a more equitable and thoughtful society.

Opportunities

- **Planning Stages of Academic Work**: AI can significantly enhance brainstorming and outlining processes for students by providing various forms of support. For brainstorming, AI tools can generate a wide range of ideas and perspectives on a given topic, helping students explore different angles and approaches. These tools can use natural language processing (a branch of AI that allows computers to understand,

generate, and manipulate human language) to analyze keywords and suggest related concepts or themes that students might not have initially considered.

Regarding outlining, AI can help organize thoughts and ideas into a coherent structure. By analyzing the key points a student wants to cover, AI can recommend logical sequences and suggest sections or headings to include. AI can also offer templates or frameworks, making it easier for students to create well-structured and focused outlines. Overall, AI acts as a collaborative tool, enhancing creativity and organization while saving time and effort in the planning stages of academic work.

- **Critical Media Literacy:** Develop students' skills in analyzing and interpreting AI-generated content. AI technologies are increasingly involved in creating, curating, and disseminating information, which can impact students' understanding of the world. By guiding students in evaluating AI-driven media's credibility, bias, and accuracy, teachers help them develop essential skills for discerning reliable information from misinformation. This support fosters better decision-making and responsible media consumption. It prepares students to actively participate in an information-rich society where critical thinking and media literacy are crucial for personal and academic success.

- **Cross-Disciplinary Learning**: Encourage collaboration between technology and humanities departments to enable students to explore AI from multiple perspectives, including technical, ethical and societal viewpoints. For example, technology courses might cover the technical aspects of AI development, while humanities courses might cover the ethical, social, and legal dimensions.

  In practice, this cross-disciplinary learning equips students with the ability to navigate complex environments where AI technologies are deployed. By fostering a comprehensive understanding of AI's technical, ethical and societal dimensions, cross-disciplinary learning prepares students to address the multifaceted challenges they will encounter in their careers. This approach enhances their technical proficiency and cultivates a sense of responsibility and adaptability, making them well-equipped to contribute to a range of fields where AI plays a critical role.

Cautions

- **Cheating**: As AI tools become more advanced, students are increasingly tempted to misuse these technologies to gain unfair advantages in their academic work. For example, AI-powered writing assistants or problem-solving tools can facilitate shortcuts that bypass genuine learning processes, leading to academic integrity issues. This misuse undermines the educational goals of fostering critical thinking and problem-solving skills and diminishes the trust in AI technologies and their potential benefits. To address this concern, educators must emphasize the importance of ethical behavior and ensure

that students understand how to use AI responsibly and transparently, reinforcing that AI should be a tool for learning and enhancement, not a means of circumventing effort and integrity. Students need to be exposed to learning activities where they can use AI and those where it is not appropriate. This will help students learn to distinguish the differences and develop a sense of ethics around AI use.

- **Data Security**: The handling and use of data are central to AI technologies. Students need to understand that AI systems often require large amounts of data, which can include sensitive personal information. Teachers also need to understand that students' private identifiable information should never be entered into an AI system without data security safeguards and a knowledge of what AI platform is powering the technological tool and the data will be stored and used. If this data is not properly secured, it can lead to breaches that compromise privacy, expose individuals to identity theft, or result in unauthorized access to confidential information. Moreover, inadequate data security practices can erode trust in AI technologies and lead to legal and ethical violations. Thus, educators must emphasize the importance of safeguarding data and adhering to strict security protocols to prevent misuse and ensure ethical AI use.

- **Deepfakes and Hallucinations**: Deepfakes and AI hallucinations undermine the trustworthiness of information and can lead to serious ethical dilemmas. Deepfakes, which involve the manipulation of videos or images to create highly realistic but false representations, can be used to spread misinformation, manipulate public opinion, and damage reputations. AI hallucinations, where AI systems generate content that appears accurate but is entirely fabricated, can spread false information that users might mistakenly trust. These technologies can be particularly harmful in educational contexts if students are not equipped to evaluate the reliability of AI-generated content critically. Therefore, it is crucial for educators to teach students how to recognize and respond to these issues, fostering an ethical approach to AI use that prioritizes accuracy and integrity.

Educator's Story

To be filled in later

Resources

1. Code.org, CoSN, Digital Promise, European EdTech Alliance, Larimore, J., and PACE (2023). AI Guidance for Schools Toolkit. Retrieved from teachai.org/toolkit. [October 2024].
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Appendix

Artificial Intelligence Literacy for Educators

Skills and Aptitudes for Educational Roles

Educational Role	Aptitudes	Knowledge/Skills
Teacher	Always learning - flexible thinking around technology. Flexible use of platforms: teachers need to be flexible with platforms so their students can be flexible with platforms. Adaptability: Willingness to learn and adapt to new AI technologies as they evolve. Teachers need to incorporate these tools in their instruction so students are equipped for their future careers and lives. AI is a tool that can be used to enhance instruction - not as a replacement for teachers. AI is a powerful tool when combined with powerful instructional design and strategies. AI is a tool that can support student learning. All technology adapts and changes over time. We need	Understand that AI models make predictions based on a large amount of data, and those models are not infallible and can amplify existing harm to different communities. Understand AI's full potential, what it is and is not, and how to efficiently and ethically use AI tools and prompts to plan effective instruction. Plan powerful teaching and learning that uses AI as a tool and supports students to learn about and use AI ethically and efficiently. Develop a general understanding of AI tools and their uses and risks with the flexibility to translate knowledge to other tools (i.e., remaining program agnostic). Understand how AI tools work and how to integrate them into the curriculum. Develop an understanding of where AI tools source their information and how to support students in citing information gained from AI platforms or products generated with AI.

Educational Role	Aptitudes	Knowledge/Skills
	to be flexible to adapt this change to our teaching and learning.	Understand how does/will AI affect their content area and future careers in that content area. Use AI-generated data from instructional and assessment programs to inform/design instruction. Communicate AI/Tech needs needed for the classroom to school and district leaders. (up/down communication). Communicate the importance of learning AI to students and parents. (sideways communication).
School/District Leader	Provide teachers with ongoing job-embedded PD with support- time to discuss challenges, successes, and concerns. Set expectations for teachers to use and incorporate new platforms and tools into their instruction. Commit to using AI to help students be prepared for their future careers and lives. AI is a tool that can enhance instruction—not as a replacement for teachers. To do this, students will need to use AI effectively and ethically.	Adopt new platforms into the school to model the use of AI (help teachers become familiar with them). (program agnostic) Clearly communicate boundaries for using AI and privacy concerns with school/district data and student data. Communicate AI/Tech needs to the district and/or school board. (up/down communication). Communicate the importance of learning AI to students and parents. (sideways communication).

Educational Role	Aptitudes	Knowledge/Skills
	All technology adapts and changes over time. We must be flexible to adapt this change to our teaching and learning.	

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TOOL 1

HESS COGNITIVE RIGOR MATRIX | READING-LISTENING CRM

Integrating Depth-of-Knowledge Levels with Bloom's Cognitive Process Dimensions

Revised Bloom's Taxonomy	DOK Level 1 Recall and Reproduction	DOK Level 2 Skills and Concepts	DOK Level 3 Strategic Thinking or Reasoning	DOK Level 4 Extended Thinking
Remember Retrieve knowledge from long-term memory, recognize, recall, locate, identify	▫ Recall, recognize, or locate basic facts, terms, details, events, or ideas explicit in texts ▫ Read words orally in connected text with fluency and accuracy	Use these Hess CRM curricular examples with most close reading or listening assignments or assessments in any content area.		
Understand Construct meaning, clarify, paraphrase, represent, translate, illustrate, give examples, classify, categorize, summarize, generalize, infer a logical conclusion, predict, compare-contrast, match like ideas, explain, construct models	▫ Identify or describe literary elements (characters, setting, sequence, etc.) ▫ Select appropriate words when intended meaning or definition is clearly evident ▫ Describe or explain who, what, where, when, or how ▫ Define or describe facts, details, terms, principles ▫ Write simple sentences	▫ Specify, explain, show relationships; explain why (e.g., cause-effect) ▫ Give non examples or examples ▫ Summarize results, concepts, ideas ▫ Make basic inferences or logical predictions from data or texts ▫ Identify main ideas or accurate generalizations of texts ▫ Locate information to support explicit-implicit central ideas	▫ Explain, generalize, or connect ideas using supporting evidence (quote, example, text reference) ▫ Identify or make inferences about explicit or implicit themes ▫ Describe how word choice, point of view, or bias may affect the readers' interpretation of a text ▫ Write multi paragraph composition for specific purpose, focus, voice, tone, and audience	▫ Explain how concepts or ideas specifically relate to other content domains (e.g., social, political, historical) or concepts ▫ Develop generalizations of the results obtained or strategies used and apply them to new problem-based situations
Apply Carry out or use a procedure in a given situation; carry out (apply to a familiar task), or use (apply) to an unfamiliar task	▫ Use language structure (pre-, or suffix) or word relationships (synonym or antonym) to determine meaning of words ▫ Apply rules or resources to edit spelling, grammar, punctuation, conventions, word use ▫ Apply basic formats for documenting sources	▫ Use context to identify the meaning of words or phrases ▫ Obtain and interpret information using text features ▫ Develop a text that may be limited to one paragraph ▫ Apply simple organizational structures (paragraph, sentence types) in writing	▫ Apply a concept in a new context ▫ Revise final draft for meaning or progression of ideas ▫ Apply internal consistency of text organization and structure to composing a full composition ▫ Apply word choice, point of view, style to impact readers' or viewers' interpretation of a text	▫ Illustrate how multiple themes (historical, geographic, social, artistic, literary) may be interrelated ▫ Select or devise an approach among many alternatives to research a novel problem
Analyze Break into constituent parts, determine how parts relate, differentiate between relevant-irrelevant, distinguish, focus, select, organize, outline, find coherence, deconstruct (e.g., for bias or point of view)	▫ Identify whether specific information is contained in graphic representations (e.g., map, chart, table, graph, T-chart, diagram) or text features (e.g., headings, subheadings, captions) ▫ Decide which text structure is appropriate to audience and purpose	▫ Categorize or compare literary elements, terms, facts or details, events ▫ Identify use of literary devices ▫ Analyze format, organization, and internal text structure (signal words, transitions, semantic cues) of different texts ▫ Distinguish relevant-irrelevant information; fact or opinion ▫ Identify characteristic text features; distinguish between texts, genres	▫ Analyze information within data sets or texts ▫ Analyze interrelationships among concepts, issues, problems ▫ Analyze or interpret author's craft (literary devices, viewpoint, or potential bias) to create or critique a text ▫ Use reasoning, planning, and evidence to support inferences	▫ Analyze multiple sources of evidence, or multiple works by the same author, or across genres, time periods, themes ▫ Analyze complex or abstract themes, perspectives, concepts ▫ Gathe; analyze, and organize multiple information sources ▫ Analyze discourse styles
Evaluate Make judgments based on criteria, check, detect inconsistencies or fallacies, judge, critique	"DOS"—unsubstantiated generalizations = stating an opinion without providing any support for it!		▫ Cite evidence and develop a logical argument for conjectures ▫ Describe, compare, and contrast solution methods ▫ Verify reasonableness of results ▫ Justify or critique conclusions drawn	▫ Evaluate relevancy, accuracy, and completeness of information from multiple sources ▫ Apply understanding in a novel way, provide argument or justification for the application
Create Reorganize elements into new patterns or structures, generate, hypothesize, design, plan, produce	▫ Brainstorm ideas, concepts, problems, or perspectives related to a topic, principle, or concept	▫ Generate conjectures or hypotheses based on observations or prior knowledge and experience	▫ Synthesize information within one source or text ▫ Develop a complex model for a given situation ▫ Develop an alternative solution	▫ Synthesize information across multiple sources or texts ▫ Articulate a new voice, alternate theme, new knowledge or perspective